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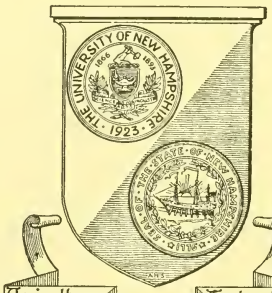

The University
of
New Hampshire

Bulletin 432 September 1956

THE UNIVERSITY OF NEW HAMPSHIRE
AGRICULTURAL EXPERIMENT STATION

Department of Agricultural and Biological Chemistry

INSPECTION OF COMMERCIAL FERTILIZERS

Made for the

STATE DEPARTMENT OF AGRICULTURE

H. A. DAVIS and V. F. STAAB

THE UNIVERSITY OF NEW HAMPSHIRE
DURHAM, N. H.

INSPECTION OF COMMERCIAL FERTILIZERS

Made for the
STATE DEPARTMENT OF AGRICULTURE

This bulletin reports the analysis of 174 official samples of commercial fertilizers and fertilizer materials submitted for analysis during the year ending June 30, 1956.

The inspection of commercial fertilizers was made under the direction of the Honorable Perley I. Fitts, Commissioner of Agriculture. The samples were collected by Mr. George H. Laramie, Fertilizer Control Supervisor.

All questions relating to the New Hampshire Fertilizer Law and the registration of fertilizers or fertilizer materials prior to sale in the State, should be directed to the attention of the **Fertilizer Control Supervisor, State House, Concord, New Hampshire.** This laboratory is responsible for the analysis only of official samples as submitted.

The general character of the fertilizer and fertilizer materials sampled is shown by the following classification:

Complete fertilizer	108
(Of these, 29 also carried a total Magnesium Oxide guarantee and 13 specified water-soluble Magnesium Oxide.)	
Phosphoric acid and potash	18
(Of these, 9 carried a boron guarantee in addition.)	
Nitrogen and phosphoric acid	2
Superphosphate	17
Ammonium Nitrate	5
Nitrate of soda	1
Cyanamid	1
Milorganite	2
Potash	1
Urea	1
Ground Bone	4
Manure	10
Tankage	1
Liquid fertilizers (concentrate)	1
Liquid fertilizer (dilute)	1
Ammonia solution	1

THE FERTILIZER LAW

The New Hampshire Commercial Fertilizer Law, Chapter 228, was rewritten, brought up to date, and enacted by the 1955 session of the Legislature. It was effective as of January 1, 1956.

Anyone interested in the use, sale, or distribution of fertilizers in the State should write to the State Department of Agriculture, State House, Concord, New Hampshire and obain a copy of a booklet published by that Department titled "New Hampshire Fertilizer Law and Rules and Regulations."

The requirements of the law concerning the **registration, guarantee** and **labeling** of Commercial Fertilizers in New Hampshire are quoted as follows:

"Sec. 4: Registration. (a) Each brand and grade of commercial fertilizer shall be registered before being offered for sale, sold or distributed in this state. The application for registration shall be submitted to the commissioner on forms furnished by the commissioner, and shall be accompanied by a fee, per brand, as follows: ten dollars for the phosphoric acid, ten dollars for the nitrogen, ten dollars for the potash, and ten dollars for the magnesium oxide, or other plant food elements, compounds or classes of compounds; contained or claimed to be in the said brand of fertilizer; but the fee for any brand shall not exceed twenty-five dollars. All registrations expire on or before January 1, annually. The application shall include the following information in the following order: (1) The name and address of the person guaranteeing the fertilizer. (2) The brand and grade. (3) The guaranteed analysis showing the minimum percentage of plant food claimed in the following order and form: Total nitrogen ..... per cent; available phosphoric acid ..... per cent; soluble potash ..... per cent; Unacidulated mineral phosphatic materials and basic slag shall be guaranteed as to both total and available phosphoric acid, and the degree of fineness. In the case of bone, tankage, and other natural organic phosphate materials, only the total phosphoric acid need be

guaranteed. Additional plant food elements, determinable by chemical methods, may be guaranteed only by permission of the commissioner by and with the advice of the director of the agricultural experiment station. When any such additional plant foods are claimed, they shall be included in the guarantee, and shall be subject to inspection and analysis in accordance with the methods and regulations that may be prescribed by the commissioner.

(b) A distributor shall not be required to register any brand of commercial fertilizer which is already registered hereunder by another person.

(c) The plant food content of each and every brand of commercial fertilizer must remain uniform for the period of registration.

Sec. 5: Labeling. (a) Any commercial fertilizer offered for sale or sold or distributed in this state in bags, barrels, or other containers shall have placed on or affixed to the container in written or printed form the net weight and the information required. (1), (2) and (3) of paragraph (a) of section 4 either (1) on tags affixed to the end of the package between the ears and/or on the sewed end or (2) directly on the package. (b) If distributed in bulk, a written or printed statement of the weight and the information required by (1), (2) and (3) of paragraph (a) of section 4 shall accompany delivery and be supplied to the purchaser."

The Law provides for the levying of a penalty amounting to three times the commercial value of the constituent found deficient when deficiencies exceeding allowed tolerances are found. The following table of tolerances as adopted by the State Department of Agriculture is quoted from the Rules and Regulations of that Department.

Total Nitrogen		Available Phosphoric Acid		Soluble Potash	
Guarantee	Deficiency	Guarantee	Deficiency	Guarantee	Deficiency
2%	0.20	0-10% inc.	0.40	2%	0.20
3%	0.25	10-25% inc.	0.50	3%	0.30
4%	0.35	Over 25%	0.75	4%	0.40
5-8% inc.	0.40			4-8% inc.	0.50
8-30% inc.	0.50			8-20% inc.	0.60
Over 30%	0.75			Over 20%	1.00

The chief purpose of the official inspection of fertilizers is to protect the consumer against misbranded products that probably would soon appear on the market if the sale of fertilizer was not under State regulation. If the consumer accepts fertilizer not labeled in compliance with the law, he does so at his own risk. He should acquaint himself with the requirements of the law concerning labeling and be familiar with the terms and symbols used on the label.

A commercial fertilizer generally supplies one or more of three elements; nitrogren, phosphorus and potassium; which are commonly required in relatively large amounts for plant growth. The percentage of each of these three materials is usually represented by numerals in designating the grade of a fertilizer. These percentages are presently expressed in terms of **nitrogen, phosphorus pentoxide** and **potash,** and the symbols used are N, P_2O_5 and K_2O respectively. The term phosphoric acid is commonly used when referring to the phosphorus content. This terminology is confusing and the designation of the fertilizer content is being referred to more and more in terms of the element, N, P and K. A movement is underway to adopt as official and put into standard practice the expression of nitrogen, phosphorus and potash in terms of the elements. To be effective this must be done on a nationwide basis and at the same time.

Under certain conditions, other elements such as magnesium, boron and other so-called minor elements are needed to correct soil deficiencies in certain localities. These may be included in the mixed fertilizer.

Much advertising of fertilizer materials packed in small packages is directed to the attention of the home gardener and growers of house plants. This small package serves a definite need, however the "miracle" results claimed may not always be obtained. In general, it is more economical for the gardener to purchase fertilizer of a reliable brand and in reasonably large packages.

During the past year, interest among tank truck operators in the application of liquid fertilizers has not been as apparent as in the previous year. Difficulty and the cost involved in solving a number of practical problems such as corrosion, proper timing of applications, and others, accounts for this decline of interest. Certain large operators are investigating the use of ammonia concentrates in liquid and gas form under New Hampshire conditions.

All control officials charged with the enforcement of state laws regulating the sale of commercial fertilizers and fertilizer materials are joined in the Association of American Fertilizer Control Officials. Research workers employed by State or Federal Agencies engaged in the investigation of fertilizers are also members of this Association. The object of this organization is to "promote uniform and effective legislation, definitions, rulings, and enforcement of laws relating to the control of sale and distribution of mixed fertilizers and fertilizer materials in the Continent of North America. At the annual meetings of the Association, reports and recommendations of investigators concerning definitions of fertilizer materials, use of new products, and problems concerning regulation of the fertilizer trade are discussed in detail. Fertilizer manufacturers are invited to participate in these discussions and through mutual co-operation, the farmer is supplied with a product that can be relied upon to do the job expected in crop production. The official publication of the Association may be obtained for a small fee through the office of its secretary, B. D. Cloaninger, Clemson, South Carolina. This booklet contains the official terms describing fertilizer materials, a proposed model state fertilizer law, as well as the proceedings of the annual meeting.

Whether or not a fertilizer contains the guaranteed amount of plant food can be determined only by a chemical analysis. For this reason, it is considered necessary that each brand of fertilizer offered for sale be officially sampled and analyzed each year. When failure to meet the guarantee is proved by chemical analysis, the prosecution or seizure provisions of the law may be invoked. The purchaser's refusal to buy a fertilizer which does not conform to the law will not only assist in the enforcement of the law, but will at the same time insure him the protection of the law.

USE OF COMMERCIAL FERTILIZERS

It is not within the scope of this department to make recommendations regarding the use of commercial fertilizers. The Department of Agronomy and the Department of Agricultural and Biological Chemistry of the University of New Hampshire Agricultural Experiment Station test soils and conduct experimental work with various fertilizer materials on hay and crop land. The Department of Horticulture investigates fertilizer treatments for fruits and vegetables. Much of this work has been published, and is available for free distribution to residents of New Hampshire. Address your request to Mail Service, University of New Hampshire, Durham, New Hampshire. A list of currently available publications on fertilization follows:

Sta. Cir.	74	The Response of Clover and Total Forage to Top-Dressing Fertilizers
Ext. Bull.	125	Growing Strawberries in New Hampshire
Ext. Bull.	129	Forage Crop Production in New Hampshire
Ext. Bull.	130	Care of the Established Lawn
Ext. Bull.	324	Experiment with Potatoes
Ext. Cir.	275	Culture of Low-Bush Blueberries
Ext. Cir.	309	Growing Grapes in New Hampshire
Ext. Cir.	310	Cane Fruit Culture
Ext. Cir.	314	Tomatoes for New Hampshire
Ext. Bull.	100	Growing Apples in New Hampshire
Ext. Bull.	104	Growing Vegetables at Home
Ext. Bull.	105	Asparagus in New Hampshire
Ext. Bull.	116	Hotbeds and Coldframes
Ext. Bull.	118	Growing Potatoes in New Hampshire
Sta. Bull.	424	Soils and Their Crop Adaptations in New Hampshire
Folder		New Hampshire Recommendations for Seed, Fertilizer and Lime

While the word "fertilizer" does not appear in all of the above titles, none is included which does not discuss the use of fertilizer.

CONFORMITY TO GUARANTEE

The chemical analyses reported in this bulletin were made by the methods adopted by the Association of Official Agricultural Chemists. The following list indicates the number of samples equalling or failing to meet guarantee:

Number of samples analyzed	174
Equalling or exceeding all guarantees	106
Deficient in nitrogen only	34
Deficient in phosphoric acid only	10
Deficient in potash only	14
Deficient in nitrogen and phosphoric acid	2
Deficient in nitrogen and potash	3
Deficient in phosphoric acid and potash	2
Deficient in nitrogen, phosphoric acid and potash	1

Forty-two samples were guaranteed to contain Magnesium oxide. Of these, thirteen indicated the guarantee as water-soluble magnesium oxide. In these thirteen cases, the total magnesium oxide was not determined. Slight deficiencies were found in three cases of water-soluble magnesium oxide.

Boron was guaranteed in nine samples. Three exceeded the guarantee, five were very slightly below the guarantee, and one was deficient.

Most of the deficiencies were not great enough to invoke the penalty clause of the law. There were far too many small deficiencies and the manufacturer should allow a slightly larger safety margin to insure meeting all guarantees.

Fertilizers are largely mixtures of chemicals. Segregation of these materials in the bag is difficult to prevent. Modern methods of fertilizer manufacture are doing much to process the fertilizer in such a way that segregation will be avoided. The solution of this problem is difficult. To obtain a truly representative sample of a fertilizer mixture requires careful work. The chemist can accurately determine the nitrogen, phosphoric acid, and potash content of the sample sent to the laboratory. If this sample does not correctly represent the larger lot, the analytical work is of no use. The obligation of the fertilizer control program is to see that the manufacturer is supplying the guaranteed amount of plant food to the consumer. For this reason, the sample must be drawn and analyzed very carefully so that injustice will not be done to either the consumer or manufacturer.

The penalty clause was invoked in six cases for nitrogen, seven cases for phosphoric acid and five cases for potash shortages. Bold type and underline in the analyses report table shows these values. In the following table, the names of the manufacturers are arranged alphabetically. The brand names are listed alphabetically and numerically by formula, under the name of the manufacturer.

COMMERCIAL VALUE OF FERTILIZERS

Section 10. of the New Hampshire Fertilizer Law of 1955, states "For the purpose of determining the commercial values to be applied under the provisions of Section 7., the Commissioner shall determine and publish annually, the values per pound of nitrogen, phosphoric acid and potash in commercial fertilizers in this State. The values so determined and published shall be used in determining and assessing penalties."

After consulting the fertilizer manufacturers selling the major tonnage of fertilizers in New Hampshire, the Commissioner established and the Agricultural Advisory Board approved on March 6, 1956, the following commercial values per pound of nitrogen, phosphoric acid and potash:

$3.00 per Unit or 15c per pound of Nitrogen
$2.00 per Unit or 10c per pound of Phosphoric Acid
$1.20 per Unit or 6c per pound of Potash

March 27, 1956
New Hampshire Department of Agriculture
Concord, New Hampshire

	Sample Drawn In	Nitrogen (N)		Phosphoric Acid (P_2O_5)				Potash (K_2O)		Magnesium Oxide (MgO)	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Allied Chemical & Dye Corp. New York, N. Y.											
Arcadian Urea 45 Fertilizer Compound	Derry	45.00	45.46								
American Agricultural Chemical Co. N. Weymouth, Mass.											
AA Fertilizer 0-15-30	Contoocook				15.54	15.00	15.20	30.00	30.90		
AA Fertilizer 8-16-16	Contoocook	8.00	7.84		16.92	16.00	16.62	16.00	16.16		
AA Fertilizer 10-10-10	Contoocook	10.00	10.02		10.98	10.00	10.77	10.00	10.08		
AA Quality Fertilizer 0-20-20	Colebrook				20.65	20.00	20.20	20.00	20.10		
AA Quality Fertilizer 5-10-10	Concord	5.00	5.01		10.54	10.00	10.18	10.00	10.08		
AA Quality Fertilizer 5-10-10	Laconia	5.00	5.10		10.21	10.00	10.01	10.00	10.00		
AA Quality Fertilizer 5-10-10	Colebrook	5.00	5.00		10.37	10.00	10.00	10.00	9.80		
AA Quality Fertilizer 5-10-10	Stewartstown	5.00	5.04		10.70	10.00	10.19	10.00	10.00		
AA Quality Fertilizer 8-16-16	Bradford	8.00	8.00		16.78	16.00	16.37	16.00	15.56		
AA Quality Fertilizer 8-16-16	Colebrook	8.00	7.85		16.33	16.00	16.00	16.00	16.64		
AA Quality Fertilizer 10-10-10	Hillsboro	10.00	9.60		10.42	10.00	10.17	10.00	10.18		
AA Quality Fertilizer 10-10-10	Glencliff	10.00	10.00		10.50	10.00	10.27	10.00	10.20		
Agrico 18% Normal Superphosphate	Portsmouth				18.72	18.00	18.07				
Agrico for New England 5-8-7	Dover	5.00	5.00		8.82	8.00	8.41	7.00	7.14		
Agrico for New England 5-8-7	Portsmouth	5.00	5.03		8.78	8.00	8.36	7.00	7.26		
Agrico for New England 5-8-7	Hillsboro	5.00	4.83		8.74	8.00	8.25	7.00	7.12		
Agrico for Potatoes 5-10-10	Hillsboro	5.00	4.86		10.54	10.00	9.79	10.00	9.92	2.00	2.00
Agrico for Potatoes 5-10-10-2	Portsmouth	5.00	5.11		11.40	10.00	10.76	10.00	10.20	2.00	2.05
Agrico for Potatoes 5-10-10-2	Dover	5.00	5.03		10.46	10.00	10.00	10.00	9.71	2.00	2.05
Agrico Top Dressing 7-7-7	Hillsboro	7.00	7.10		7.34	7.00	7.18	7.00	7.26		
Agrico Top Dressing 10-10-10	Portsmouth	10.00	10.38		10.52	10.00	10.31	10.00	10.20		
Agrinite 7-0-0	Portsmouth	7.00	8.74								
18% Normal Superphosphate	Colebrook				18.68	18.00	18.06				
Pulverized Sheep Manure	Portsmouth	1.00	1.44	1.00	1.66			2.00	4.42		

	Sample Drawn In	Nitrogen (N)		Phosphoric Acid (P_2O_5)				Potash (K_2O)		Magnesium Oxide (MgO)	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
American Cyanamid Co. New York, N. Y.											
Aero Cyanamid Granular 21-0-0	Nashua	21.00	21.13	.....	.....	.....	.....	.....	.....	.....	.....
Aeroprills Ammonium Nitrate Fertilizer Grade 33.5%	Concord	33.50	33.50	.....	.....	.....	.....	.....	.....	.....	.....
Aeroprills Fertilizer Grade Ammonium Nitrate 33.5%	Brentwood	33.50	33.52	.....	.....	.....	.....	.....	.....	.....	.....
Aeroprills Fertilizer Grade Ammonium Nitrate 33.5%	Concord	33.50	33.55	.....	.....	.....	.....	.....	.....	.....	.....
Aeroprills Fertilizer Grade Ammonium Nitrate	Concord	33.50	33.56	.....	.....	.....	.....	.....	.....	.....	.....
Armour Fertilizer Works Atlanta, Ga.											
*Armour's Bone Meal	Keene	2.30	2.58	23.00	25.30	.....	.....	.....	.....	.....	.....
*Armour's Cattle Manure	Keene	1.85	1.85	0.75	0.97	.....	.....	1.75	2.15	.....	.....
*Armour's Sheep Manure	Keene	1.50	1.64	1.00	1.29	.....	.....	2.00	2.01	.....	.....
*Armour Vertagreen for Turf and Trees 10-6-4	Keene	10.00	9.88	.....	7.36	6.00	6.80	4.00	4.80	.....	.....
*Armour Vertagreen Plant Food 5-10-5	Keene	5.00	5.31	.....	11.88	10.00	10.51	5.00	5.28	.....	.....
Buell Fertilizer Company Exeter, N. H.											
Buell Peat Poultry Manure	Manchester	3.00	3.45	3.00	4.49	.....	.....	1.50	2.55	.....	.....
Buell Peat Poultry Manure	Portsmouth	3.00	3.53	3.00	3.00	.....	.....	1.50	1.98	.....	.....
Chilean Nitrate Sales Corp. New York, N. Y.											
Champion Brand Chilean Nitrate of Soda 16%	Concord	16.00	16.04	.....	.....	.....	.....	.....	.....	.....	.....

Consolidated Rendering Co. Boston, Mass.											
Corenco 4-12-16 Ladino Special	Colebrook	4.00	4.41		12.74	12.00	12.51	16.00	16.16		
Corenco 5-8-7 Potato & General Crop	Nashua	5.00	5.28		8.88	8.00	8.51	7.00	7.80		
Corenco 5-8-7 Potato & General Crop	Colebrook	5.00	5.10		8.88	8.00	8.52	7.00	7.80		
Corenco 5-10-10-2	Colebrook	5.00	5.21		10.67	10.00	10.33	10.00	10.16	2.00†	2.01
*Corenco Complete Fruit & Top Dressing 7-7-7	Derry	7.00	7.03		7.28	7.00	7.14	7.00	7.68		
Corenco 7-7-7 Complete Fruit & Top Dressing	Nashua	7.00	6.84		7.70	7.00	7.53	7.00	7.74		
Corenco 8-16-16 Two in One	Colebrook	8.00	7.70		17.26	16.00	16.67	16.00	16.64		
Corenco Fertilizer 0-20-20 Legume Special	Boscawen				20.30	20.00	20.16	20.00	19.54		
Corenco Organic Turf Fertilizer 4.75-4-0	Derry	4.75	5.10		5.80	4.00	5.08				
Corenco Peerless Potato 5-10-10	Franklin	5.00	5.25		10.23	10.00	9.65	10.00	10.48		
Corenco 20% Superphosphate	Brentwood				20.65	20.00	20.48				
Corenco 20% Superphosphate	Dover				20.70	20.00	20.54				
Corenco 20% Superphosphate	Unity				20.60	20.00	20.48				
Corenco 20% Superphosphate	Ossipee				20.75	20.00	20.61				
Davison Chemical Corp. Baltimore, Md.											
Davco Granulated Fertilizer 5-10-10	Concord	5.00	5.52		10.28	10.00	10.08	10.00	10.20		
*Davco Granulated Fertilizer 8-16-16	Concord	8.00	7.14		15.57	16.00	15.13	16.00	16.08		
Davco Granulated Fertilizer 10-10-10	Concord	10.00	10.16		10.12	10.00	10.02	10.00	9.80		
*Davco Granulated Turf & Garden Food 5-10-5	Concord	5.00	5.03		9.83	10.00	9.67	5.00	5.52		
Davco Granulated 20% Superphosphate	Concord				21.45	20.00	20.73				
Eastern States Farmers Exchange, Inc. W. Springfield, Mass.											
[1]Eastern States Fertilizer 0-15-30	Woodsville				16.20	15.00	15.93	30.00	29.52		
[2]Eastern States Fertilizer 0-15-30	Bradford				15.48	15.00	15.22	30.00	31.04		
Eastern States Fertilizer 0-25-25	Woodsville				25.07	25.00	25.03	25.00	27.00		
Eastern States Fertilizer 0-25-25	Dover				24.60	25.00	24.45	25.00	26.30		
Eastern States Fertilizer 0-25-25	Durham				24.83	25.00	24.63	25.00	24.15		
Eastern States Fertilizer 0-25-25	Ossipee				27.25	25.00	27.14	25.00	24.06		
Eastern States Fertilizer 5-10-10	Manchester	5.00	5.02		11.06	10.00	10.73	10.00	10.68	2.00	3.06
Eastern States Fertilizer 5-10-10	Dover	5.00	4.67		11.56	10.00	11.20	10.00	9.66	2.00	2.57
Eastern States Fertilizer 5-10-10	Concord	5.00	5.17		11.37	10.00	11.04	10.00	11.40	2.00	3.09

* Not Registered when sampled
† Water soluble Mgo

1 Boron Guaranteed 0.2%; Boron Found 0.27%
2 Boron Guaranteed 0.2%; Boron Found 0.25%

	Sample Drawn In	Nitrogen (N)		Phosphoric Acid (P_2O_5)				Potash (K_2O)		Magnesium Oxide (MgO)	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Eastern States Farmers Exchange W. Springfield, Mass. (continued)											
Eastern States Fertilizer 5-10-10	Dover	5.00	5.52	.....	11.02	10.00	10.75	10.00	10.80	2.00	3.55
Eastern States Fertilizer 5-10-10	E. Colebrook	5.00	5.63	.....	10.96	10.00	10.73	10.00	11.04	2.00	3.92
Eastern States Fertilizer 8-12-12-LC	Dover	8.00	8.36	.....	12.24	12.00	12.11	12.00	13.92	2.00†	2.56
Eastern States Fertilizer 8-16-16	Manchester	8.00	8.13	.....	16.29	16.00	16.04	16.00	16.80	1.00†	1.08
Eastern States Fertilizer 8-16-16	Dover	8.00	8.13	.....	16.35	16.00	16.07	16.00	16.80	1.00†	1.33
Eastern States Fertilizer 8-16-16	Canterbury	8.00	7.67	.....	16.96	16.00	16.72	16.00	17.20	1.00†	1.10
Eastern States Fertilizer 8-16-16	Bradford	8.00	7.79	.....	17.40	16.00	17.21	16.00	16.48	1.00†	1.31
Eastern States Fertilizer 8-16-16	Woodsville	8.00	8.21	.....	16.72	16.00	16.42	16.00	17.20	1.00†	1.17
Eastern States Fertilizer 8-16-16	Ossipee	8.00	8.00	.....	16.51	16.00	16.30	16.00	16.48	1.00†	1.25
Eastern States Fertilizer 10-10-10	Woodsville	10.00	10.00	.....	10.66	10.00	10.38	10.00	11.24	1.00	1.52
Eastern States Fertilizer 10-10-10	Manchester	10.00	10.09	.....	10.58	10.00	10.30	10.00	10.76	1.00	1.57
Eastern States Fertilizer 10-10-10	Dover	10.00	9.70	.....	11.15	10.00	10.95	10.00	10.80	1.00	1.32
Eastern States Fertilizer 10-10-10	Concord	10.00	10.10	.....	10.78	10.00	10.54	10.00	11.04	1.00	1.48
Eastern States Fertilizer 10-10-10	Dover	10.00	10.55	.....	11.65	10.00	11.48	10.00	9.41	1.00	1.25
Eastern States Fertilizer 10-10-10	Bradford	10.00	10.00	.....	10.68	10.00	10.34	10.00	11.24	1.00	1.24
Eastern States Granulated 20% Superphosphate	Manchester	.....	.....	.....	21.45	20.00	20.82	.....	.....	.....	.....
Eastern States Granulated 20% Superphosphate	Dover	.....	.....	.....	20.50	20.00	20.33	.....	.....	.....	.....
Eastern States Granulated 20% Superphosphate	Concord	.....	.....	.....	21.43	20.00	21.09	.....	.....	.....	.....
International Minerals & Chemical Corp. Woburn, Mass.											
*Fertilis Plan Food 8-6-2	W. Lebanon	8.00	7.90	.....	6.73	6.00	6.12	2.00	2.28	.....	.....
*International Bone Meal 2.47-23-0	Boscawen	2.47	2.55	23.00	25.10	.....	.....	.....	.....	.....	.....
*International Fertilizer 0-14-14	Stewartstown	.....	.....	.....	14.56	14.00	14.18	14.00	14.00	.....	.....

[3]International Fertilizer 0-15-30	Concord				15.50	15.00	15.32	30.00	31.30		
[4]International Fertilizer 0-15-30	Concord				15.52	15.00	15.36	30.00	30.90		
[5]International Fertilizer 0-15-30	Glencliff				15.88	15.00	15.61	30.00	31.80		
[6]International Fertilizer 0-20-20	Manchester				21.10	20.00	20.71	20.00	20.60		
[7]International Fertilizer 0-20-20	Laconia				20.40	20.00	20.02	20.00	21.90		
*International Fertilizer 0-20-20	Durham				20.40	20.00	20.12	20.00	20.70		
[8]International Fertilizer 0-20-20	Durham				20.40	20.00	20.07	20.00	**19.05**		
[9]International Fertilizer 0-20-20	Glencliff				20.13	20.00	19.79	20.00	19.46		
International Fertilizer 4-12-16-1	N. Haverhill	4.00	4.32		12.80	12.00	12.21	16.00	15.56	1.00	1.62
International Fertilizer 5-8-7-1	Goffstown	5.00	5.02		8.48	8.00	8.23	7.00	7.48	1.00	1.38
International Fertilizer 5-8-7-1	Tilton	5.00	4.85		9.10	8.00	8.13	7.00	7.66	1.00	1.36
*International Fertilizer 5-10-5-1	W. Lebanon	5.00	5.02		10.34	10.00	10.00	5.00	5.24	1.00	2.45
International Fertilizer 5-10-10-1	Concord	5.00	5.04		10.58	10.00	10.13	10.00	10.30	1.00	1.57
International Fertilizer 5-10-10-1	Laconia	5.00	4.74		11.04	10.00	10.21	10.00	10.72	1.00	1.37
International Fertilizer 5-10-10-1	Grasmere	5.00	5.18		10.50	10.00	10.02	10.00	10.20	1.00	1.39
International Fertilizer 5-10-10-2 Potato	W. Lebanon	5.00	5.00		10.66	10.00	10.14	10.00	9.72	2.00†	2.20
International Fertilizer 7-7-7-1	Boscawen	7.00	6.75		7.84	7.00	7.54	7.00	7.20	1.00	1.91
International Fertilizer 7-7-7-1	Tilton	7.00	6.89		7.80	7.00	7.46	7.00	7.12	1.00	2.29
*International Fertilizer 8-6-4	Boscawen	8.00	9.57		6.68	6.00	6.54	4.00	4.56		
International Fertilizer 8-16-16	Durham	8.00	7.90		15.86	16.00	**15.42**	16.00	16.08		
International Fertilizer 8-16-16	W. Lebanon	8.00	7.77		16.70	16.00	16.18	16.00	16.16		
International Fertilizer 8-16-16	Tilton	8.00	8.00		16.13	16.00	15.60	16.00	16.16		
International Fertilizer 8-16-16	Glencliff	8.00	7.72		16.46	16.00	16.00	16.00	16.64		
International Fertilizer 8-16-16	E. Colebrook	8.00	**7.59**		16.97	16.00	16.43	16.00	16.64		
International Fertilizer 10-10-10-1	Concord	10.00	9.52		10.91	10.00	10.61	10.00	10.10	1.00	1.54
International Fertilizer 10-10-10-1	Laconia	10.00	9.92		10.62	10.00	10.33	10.00	10.72	1.00	1.30
International Fertilizer 10-10-10-1	Durham	10.00	9.84		10.48	10.00	10.16	10.00	10.20	1.00	1.24
International Fertilizer 10-10-10-1	W. Lebanon	10.00	9.71		10.50	10.00	10.26	10.00	10.24	1.00	1.02
International Fertilizer 10-10-10-1	Tilton	10.00	9.74		10.54	10.00	10.25	10.00	10.00	1.00	1.43
International Fertilizer 20% Superphosphate	Manchester				20.50	20.00	20.35				
International Fertilizer 20% Superphosphate	Concord				20.53	20.00	20.43				
International Fertilizer 20% Superphosphate	Laconia				20.27	20.00	20.07				

* Not Registered when sampled
† Water soluble Mgo
3 Boron Guaranteed 0.56%; Boron Found 0.56%
4 Boron Guaranteed 0.56%; Boron Found 0.50%
5 Boron Guaranteed 0.56%; Boron Found 0.50%
6 Boron Guaranteed 0.56%; Boron Found 0.44%
7 Boron Guaranteed 0.56%; Boron Found 0.45%
8 Boron Guaranteed 0.56%; Boron Found 0.34%
9 Boron Guaranteed 0.56%; Boron Found 0.47%

	Sample Drawn In	Nitrogen (N)		Phosphoric Acid (P_2O_5)				Potash (K_2O)		Magnesium Oxide (MgO)	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
International Minerals & Chemicals Co. Woburn, Mass. (continued)											
International Mello-Green 5-4-0	W. Lebanon	5.00	5.28	.....	5.87	4.00	5.25	.....	.....	.....	.....
*International 60% Muriate of Potash	Boscawen	.....	.....	.....	.....	.....	.....	60.00	60.04	.....	.....
International 20% Superphosphate	Concord	.....	.....	.....	20.10	20.00	20.01	.....	.....	.....	.....
International 20% Superphosphate	Glencliff	.....	.....	.....	20.43	20.00	20.25	.....	.....	.....	.....
Merrimack Farmers Exchange, Inc. Concord, N. H.											
Merrimack Fertilizer 5-8-7	Franklin	5.00	5.03	.....	8.20	8.00	8.03	7.00	7.64	.....	.....
*Merrimack Fertilizer 5-10-10	Derry	5.00	5.31	.....	9.97	10.00	**9.54**	10.00	10.72	.....	.....
Merrimack Fertilizer 5-10-10	Boscawen	5.00	5.16	.....	10.32	10.00	9.78	10.00	10.48	.....	.....
*Merrimack Fertilizer 5-10-10-2	Brentwood	5.00	5.06	.....	10.26	10.00	10.00	10.00	10.30	2.00†	2.21
Merrimack Fertilizer 7-7-7	Bradford	7.00	7.01	.....	7.92	7.00	7.73	7.00	7.66	.....	.....
Merrimack Fertilizer 8-16-16	Brentwood	8.00	7.81	.....	16.76	16.00	16.38	16.00	16.20	.....	.....
Merrimack Fertilizer 8-16-16	Concord	8.00	8.07	.....	16.90	16.00	16.43	16.00	16.50	.....	.....
Merrimack Fertilizer 8-16-16	Concord	8.00	7.79	.....	17.18	16.00	16.73	16.00	16.60	.....	.....
Merrimack Fertilizer 8-16-16	Franklin	8.00	**7.55**	.....	17.78	16.00	17.27	16.00	**15.20**	.....	.....
Merrimack Fertilizer 8-16-16	Unity	8.00	8.08	.....	15.76	16.00	**15.24**	16.00	15.04	.....	.....
Merrimack Fertilizer 8-16-16	Ossipee	8.00	**7.12**	.....	16.68	16.00	16.13	16.00	16.64	.....	.....
Merrimack Fertilizer 10-10-10	Ossipee	10.00	9.78	.....	10.84	10.00	10.55	10.00	10.28	.....	.....
Merrimack Turf Green 8-6-4	Franklin	8.00	8.49	.....	6.81	6.00	6.19	4.00	4.92	.....	.....
New England Chemical Supply Co. Merrimack, N. H.											
*Agrimonia (Aqua Ammonia) (Liquid)	Walpole	24.00	24.1	.....	.....	.....	.....	.....	.....	.....	.....
Old Fox Agricultural Sales, Inc. E. Providence, R. I.											
Old Fox Fertilizer 0-20-0	Dover	.....	.....	.....	19.67	20.00	19.52	.....	.....	.....	.....

Old Fox Fertilizer 0-20-0 Superphosphate	Nashua				19.30	20.00	**19.17**				
Old Fox Fertilizer 4-16-20	Dover	4.00	4.05		17.14	16.00	16.61	20.00	**18.72**		
Old Fox Fertilizer 5-10-10	Nashua	5.00	5.06		11.26	10.00	10.40	10.00	9.84		
Old Fox Fertilizer 5-10-10-2	Dover	5.00	5.13		10.66	10.00	10.06	10.00	10.56	2.00†	1.88
Old Fox Fertilizer 5-10-10-2	Nashua	5.00	5.09		10.70	10.00	10.48	10.00	10.08	2.00†	1.84
Old Fox Fertilizer 7-7-7	Nashua	7.00	6.86		8.27	7.00	7.20	7.00	7.48		
Old Fox Fertilizer 8-12-12-1.5	Dover	8.00	7.77		12.32	12.00	12.01	12.00	12.86	1.50†	1.27
Old Fox Fertilizer 8-16-16	Nashua	8.00	**7.52**		16.64	16.00	16.27	16.00	**15.35**		
Old Fox Fertilizer 10-10-10	Nashua	10.00	**9.10**		10.70	10.00	10.54	10.00	10.56		
*Old Fox Garden Food 5-10-5	Nashua	5.00	5.04		10.98	10.00	10.06	5.00	5.52		
Old Fox Turf Food 8-6-2	Nashua	8.00	8.00		6.34	6.00	6.00	2.00	2.62		
Rogers & Hubbard Co. Portland, Conn.											
Gro-Fast Bone Meal 2-23-0	Lebanon	2.00	2.41	23.00	28.47						
Gro-Fast Cow Manure 2-1-1	Lebanon	2.00	2.05	1.00	1.33			1.00	2.28		
Gro-Fast Rose Food 7-10-5	Lebanon	7.00	7.34		14.18	10.00	11.01	5.00	5.10		
Gro-Fast Sheep Manure 1.25-1-2	Lebanon	1.25	1.42	1.00	1.00			2.00	3.93		
Sagadahoc Fertilizer Co., Inc. Bowdoinham, Maine											
Sagadahoc 5-10-10	E. Colebrook	5.00	4.82		10.86	10.00	10.01	10.00	10.20	2.00	2.18
O. M. Scott & Sons Co. Marysville, Ohio											
Scott's Turf Builder 9-7-4	Manchester	9.00	9.71		7.51	7.00	7.28	4.00	5.24		
Scott's Weed & Feed 7-11-5	Manchester	7.00	9.01		12.37	11.00	12.22	5.00	4.75		
Sears Roebuck Co. Chicago 17, Ill.											
Cross Country Bone Meal	Manchester	2.00	2.33	26.00	29.43						
Cross Country Bulb Food 4-12-8	Manchester	4.00	4.08		12.44	12.00	12.01	8.00	10.48		
*Cross Country Cattle Manure	Manchester	1.50	1.72	0.75	0.83			2.00	2.40		
Cross Country Evergreen Food 10-6-4	Manchester	10.00	9.73		6.80	6.00	6.66	4.00	4.76		
Cross Country Rose Food 5-10-5	Manchester	5.00	5.18		11.42	10.00	11.18	5.00	5.52		
*Cross Country Sheep Manure	Manchester	1.50	2.07	0.75	0.82			2.00	3.54		
Sewerage Commission City of Milwaukee Milwaukee, Wis.											
Milorganite	Bradford	5.50	5.51	4.75	3.73	4.00	**3.20**				
Milorganite	Nashua	5.50	5.58	4.75	4.29	4.00	3.74				

* Not Registered when sampled
† Water soluble Mgo

	Sample Drawn In	Nitrogen (N)		Phosphoric Acid (P_2O_5)				Potash (K_2O)		Magnesium Oxide (MgO)	
				Total		Available					
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Soil Builders International New York 36, N. Y.											
Glorion 4-8-8	Laconia	4.00	4.05	.....	9.36	8.00	8.07	8.00	8.24	.....	.....
Glorion 4-8-8	Keene	4.00	4.44	.....	9.30	8.00	8.46	8.00	8.52	.....	.....
Spencer Chemical Co. Dwight Building, Kansas City, Mo.											
*Spencer Ammonium Nitrate Fertilizer 33.5%	Woodsville	33.50	33.70	.....	.....	.....	.....	.....	.....	.....	.....
Swift & Co. Boston, Mass.											
Vigoro Complete Plant Food 6-10-4	Portsmouth	6.00	5.74	.....	10.75	10.00	10.22	4.00	4.20	.....	.....
Vigoro Complete Plant Food plus Chlordane 6-10-4	Portsmouth	6.00	6.00	.....	10.92	10.00	10.41	4.00	4.56	.....	.....
Vigoro Complete Rose Food 6-10-4	Portsmouth	6.00	6.01	.....	11.62	10.00	10.71	4.00	4.44	.....	.....
Vigoro Golden Complete Lawn Food 6-10-4	Portsmouth	6.00	6.01	.....	11.22	10.00	10.32	4.00	4.04	.....	.....
Tenny Coal Co. Concord, N. H.											
Virilium Liquid Fertilizer (dilute)	Concord	0.16	0.13	.....	.....	0.11	0.12	0.05	0.05	.....	.....
Virilium Corp. Medway, Mass.											
Virilium Liquid Fertilizer (Concentrate)	Concord	12.00	12.54	.....	.....	8.00	8.72	4.00	4.04	.....	.....
Walker Gordon Laboratory Corp Plainsboro, N. J.											
Bovung Dehydrated Cow Manure 2-1-1	Portsmouth	2.00	2.12	1.00	1.53	.....	.....	1.00	2.46	.....	.....

* Not Registered when sampled

The following products were unregistered by the New Hampshire Department of Agriculture at the time they were exposed for sale, but samples were not drawn:

(List supplied by the Fertilizer Control Supervisor.)

Joseph Breck & Sons Breck's Quick Life 16-32-16 Brexone Turf Glo 8-6-2	Boston, Mass.
Clinton Nurseries New Era Plant Food 7-15-8 New Era African Violet Food 5-12-9	Clinton, Conn.
Faesy & Besthoff, Inc. Pure Bone Meal 2.47-23-0	New York, N. Y.
Farm Bureau Association Farm Bureau 5-10-10 Farm Bureau 8-6-2	Waltham, Mass.
Hy-Trous Corp. Hy-Trous Liquid Fertilizer 4-8-4	Boston, Mass.
International Minerals & Chemicals Corp. International 0-14-14 International 0-15-30	Woburn, Mass.
Parks Barnes, Inc. Black Magic Liquid Fertilizer 10-5-5	Hermosa Beach, Calif.
Rogers & Hubbard Co. Gro Fast Bone Meal 2-23-0 Gro Fast Rose Food 7-10-5 Gro Fast Sheep Manure 1.25-1-2 Gro Fast Cow Manure 2-1-1	Portland, Conn.
Stim-U-Plant Labs. Stim-U-Plant African Violet Food 5-8-7	Columbus, Ohio
Universal Chemical Co. Electra Plant Food 5-10-3	Lynn, Mass.
Victor Chemical Works Take Hold 10-52-17	Chicago, Ill.

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no.426-450
DATE DUE

NOV 4 '64	
MAY 19 '65	
Sept 29	
OCT 28 '69	
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